Data Flow Controller DX-series

Practices Guide
S7 Protocol Component

DX100-□□□□

V307-E1-01

Revision History

Version	Revised content	Date
Version 1.0	Original production	March 30, 2026
Version 1.1	Corrected the product name. Added information on dependent modules and manual installation of modules using whl files.	April 13, 2026

CONTENTS

1.About the S7 Protocol Component Package

1.1.Overview

This package provides a custom component that runs with SpeeDBee Synapse (hereinafter referred to as Synapse). The component included in this package connects to SIEMENS SIMATIC S7 Series PLCs, collects data from register/variable information, and registers it.
By registering this package, you can use the *S7 Protocol Component*.

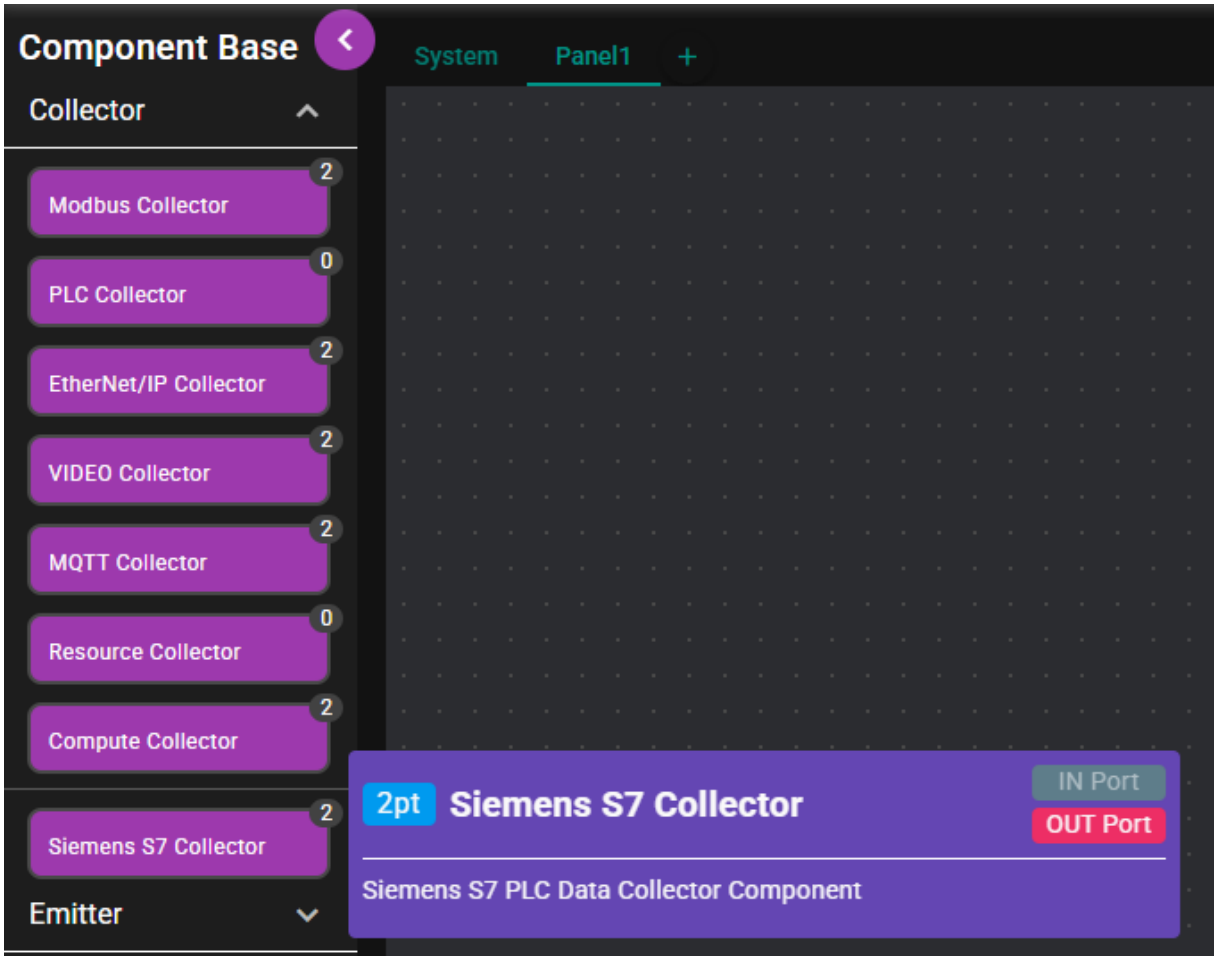
1.2.Basic Information About The Package

The component package provided is as follows.

Package file name (*1)	siemens_s7_collector.sccpkg
Operating environment	Platforms on which Synapse 4.9.9 or later is running
Component to be registered	• Siemens S7 Collector (*2)

*1 Refer to *6.2.6.4 Registering SCCPKG File in and Deleting SCCPKG File from Synapse* in the *DX-series SpeeDBee Synapse User's Manual (Cat. No. V243)* for information on registering the package.

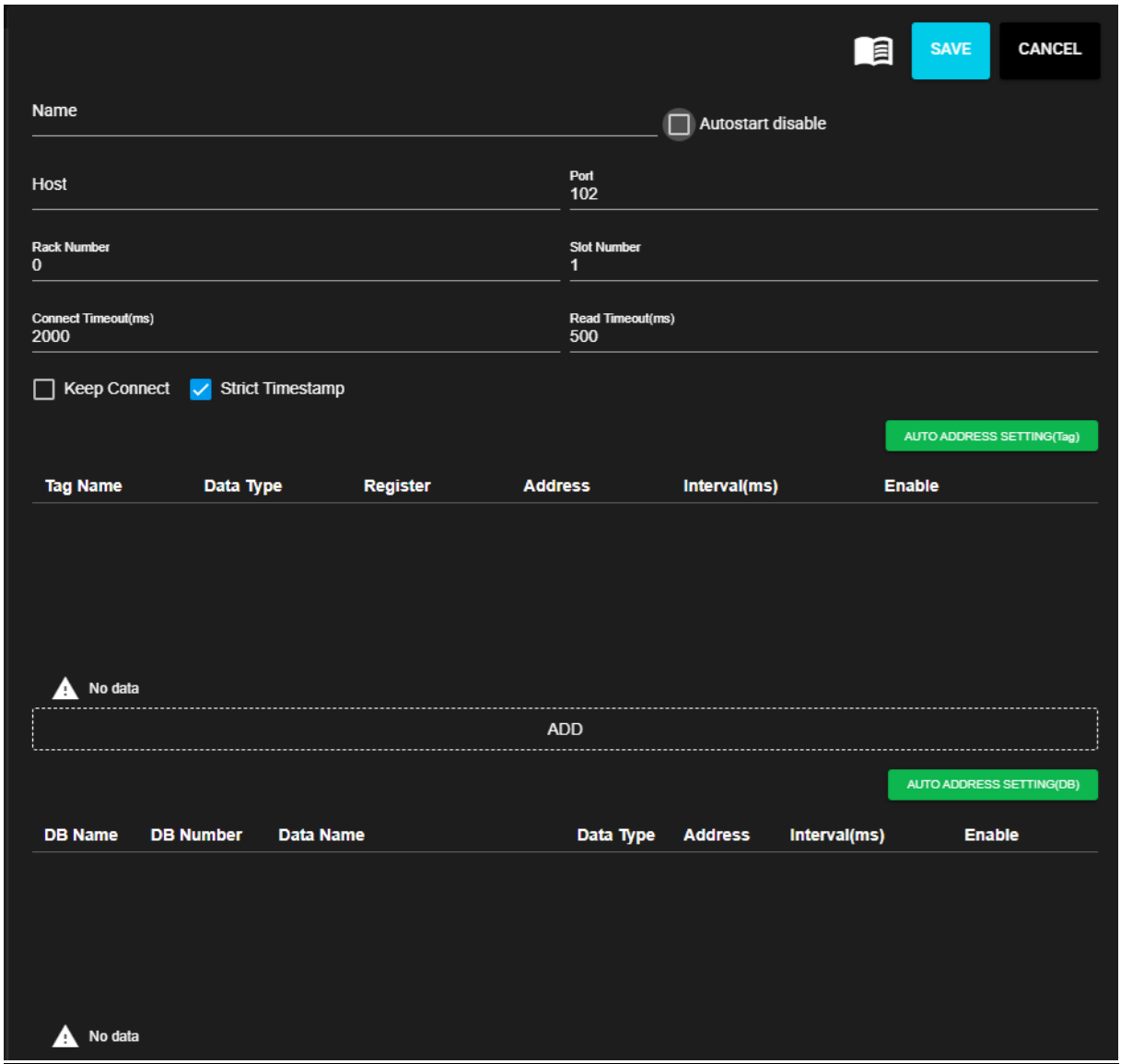
*2 The registered component will be displayed under the *Collector* category in the component list.



1.3.Setting Screen

This section describes the setting items for the component.

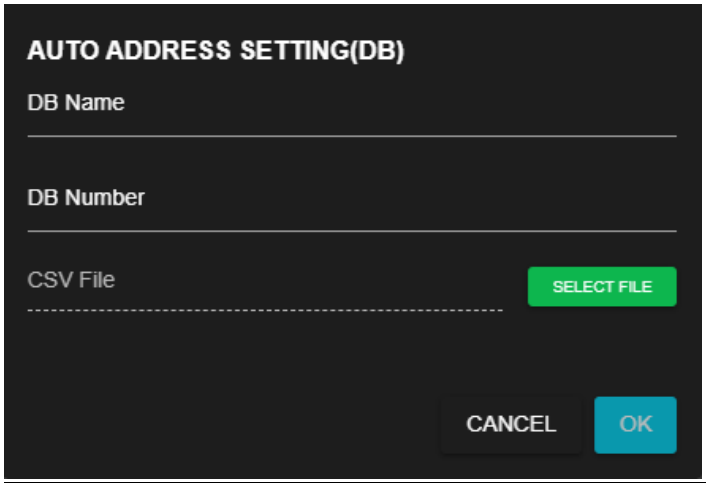
1.3.1.Setting Screen



Item	Description
Host	Enter the host name or IP address of the PLC to connect to.
Port	Enter the port of the PLC to connect to. (Default value: 102)
Rack Number	Enter the rack number of the PLC to connect to. (Default value: 0)
Slot Number	Enter the slot number of the PLC to connect to. (Default value: 1)
Connect Timeout	Enter the connection timeout duration. (Default value: 2000)
Read Timeout	Enter the read timeout duration. (Default value: 500)
Keep Connect	Select this check box to prevent the PLC connection from being closed each time a query is made.
Strict Timestamp	Select this check box to set a strict timestamp based on collected data.

AUTO ADDRESS SETTING(Tag)	Click this button to automatically set addresses at once by reading a CSV file created from the tag settings in TIA Portal.
Tag Name	Enter the tag name.
Data Type	Select the data type of the register value to retrieve.
Register	Enter the PLC register.
Address	Enter the PLC register address.
Interval(ms)	Enter the interval for retrieving the register value.
Enable	Set this to ON to retrieve the register value.
ADD	Click this button to add one row to the collection register settings using a tag.
AUTO ADDRESS SETTING(DB)	Click this button to display the screen for automatically setting addresses at once by reading a CSV file created from the data block (DB) settings in TIA Portal, where you specify the DB name, DB number, and CSV file.
DB Name	The data block (DB) name set on the AUTO ADDRESS SETTING(DB) screen is displayed. (Cannot be edited)
DB Number	The data block (DB) number set on the AUTO ADDRESS SETTING(DB) screen is displayed. (Cannot be edited)
Data Name	The data name is displayed. (Cannot be edited)
Data Type	The data type of the register value to retrieve is displayed. (Cannot be edited)
Address	The register address to retrieve is displayed. (Cannot be edited)
Interval(ms)	Enter the interval for retrieving the register value.
Enable	Set this to ON to retrieve the register value.

1.3.2.AUTO ADDRESS SETTING(DB) Screen



Item	Description
DB Name	Enter the data block (DB) name.
DB Number	Enter the data block (DB) number.
CSV File	The file name of the selected CSV file is displayed.
SELECT FILE	Click this button to display the screen for selecting a CSV file.

1.4.Supplementary Information

1.4.1.Dependent Modules

The packaged component depends on the following Python module.

Module name	Version	whl file name
python-snap7	2.0.2	python_snap7-2.0.2-py3-none-manylinux_2_28_aarch64.whl

* python-snap7 has no dependent modules (indirect dependent modules).

1.4.2.Installation of Dependent Modules

Install dependent modules as prompted by the confirmation dialog box that appears when you register this package in Synapse. python-snap7 is installed automatically.

* Synapse 4.9 and earlier versions do not support automatic installation of dependent modules during package registration. Install *python-snap7==2.0.2* according to *6.2.3.5.8 Adding External Libraries* in the *DX-series SpeeDBee Synapse User's Manual (Cat. No. V243)*.

1.4.3.Installation of Dependent Modules Using whl Files

In an offline environment, install python-snap7 using its whl file.
Using the whl file obtained in advance, install python-snap7 according to *6.2.3.5.8 Adding External Libraries* in the *DX-series SpeeDBee Synapse User's Manual (Cat. No. V243)*.

* You can download whl files from the *Python Package Index (PyPI)* website.
Download *python_snap7-2.0.2-py3-none-manylinux_2_28_aarch64.whl* from the following URL:
https://pypi.org/project/python-snap7/2.0.2/#files

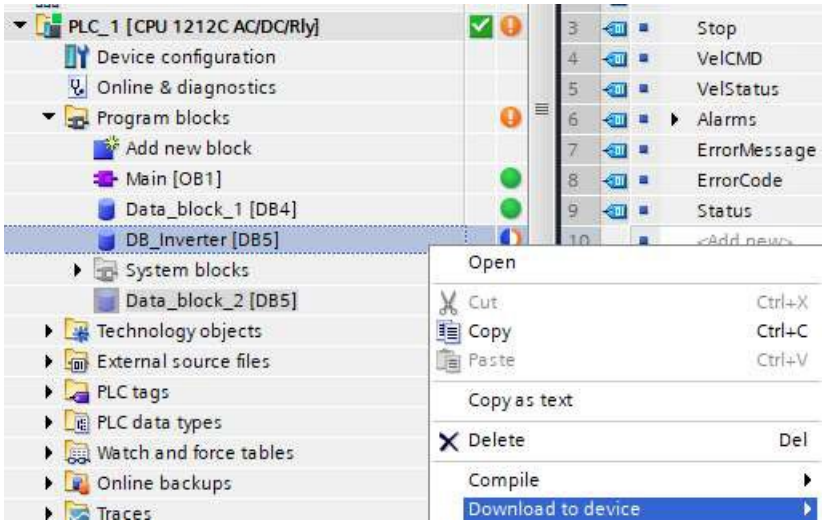
1.5.CSV File Creation

This section describes how to create a CSV file for use in auto address setting.

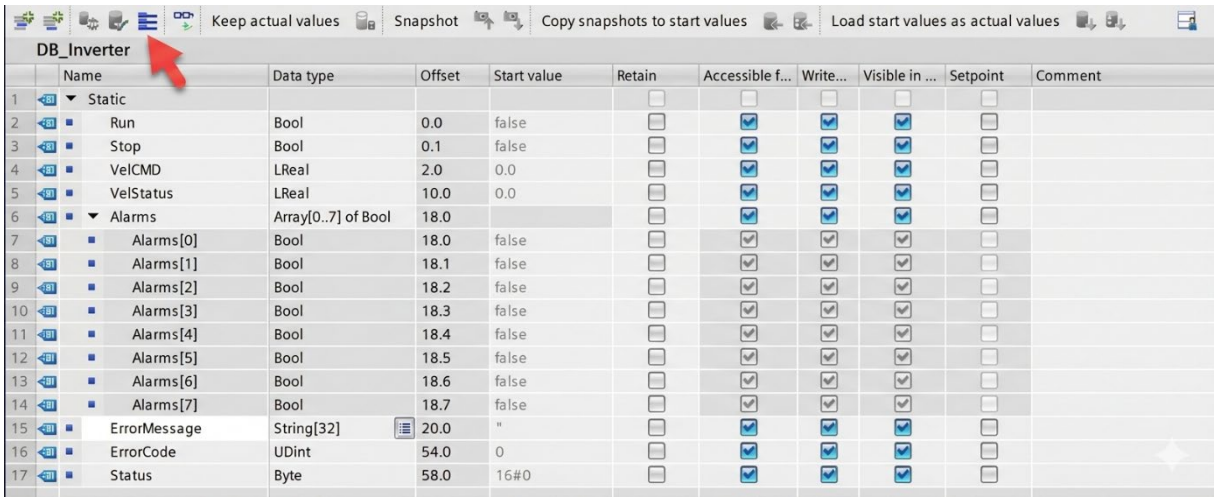
To create the CSV file, use the TIA Portal software provided by Siemens.

1.5.1.Creating a CSV File for Auto Address Setting (DB)

(1) Open the data block (hereinafter referred to as DB) you want to write to a CSV file.



(2) Expand the DB data list to display the entire DB data.



	Name	Data type	Offset	Start value	Retain	Accessible f...	Write...	Visible in ...	Setpoint	Comment
1	Static									
2	Run	Bool	0.0	false						
3	Stop	Bool	0.1	false						
4	VelCMD	LReal	2.0	0.0						
5	VelStatus	LReal	10.0	0.0						
6	Alarms	Array[0..7] of Bool	18.0							
7	Alarms[0]	Bool	18.0	false						
8	Alarms[1]	Bool	18.1	false						
9	Alarms[2]	Bool	18.2	false						
10	Alarms[3]	Bool	18.3	false						
11	Alarms[4]	Bool	18.4	false						
12	Alarms[5]	Bool	18.5	false						
13	Alarms[6]	Bool	18.6	false						
14	Alarms[7]	Bool	18.7	false						
15	ErrorMessage	String[32]	20.0	''						
16	ErrorCode	UDint	54.0	0						
17	Status	Byte	58.0	16#0						

(3) Select the entire DB, and copy and paste it into Excel.

DB_Inverter

	Name	Data type	Offset	Start value	Retain	Accessible f...	Writa...	Visible in ...	Setpoint	Comr
1	Static									
2	Run	Bool	0.0	false						
3	Stop	Bool	0.1	false						
4	VelCMD	LReal	2.0	0.0						
5	VelStatus	LReal	10.0	0.0						
6	Alarms	Array[0..7] of Bool	18.0							
7	Alarms[0]	Bool	18.0	false						
8	Alarms[1]	Bool	18.1	false						
9	Alarms[2]	Bool	18.2	false						
10	Alarms[3]	Bool	18.3	false						
11	Alarms[4]	Bool	18.4	false						
12	Alarms[5]	Bool	18.5	false						
13	Alarms[6]	Bool	18.6	false						
14	Alarms[7]	Bool	18.7	false						
15	ErrorMessage	String[32]	20.0	''						
16	ErrorCode	UDInt	54.0	0						
17	Status	Byte	58.0	16#0						

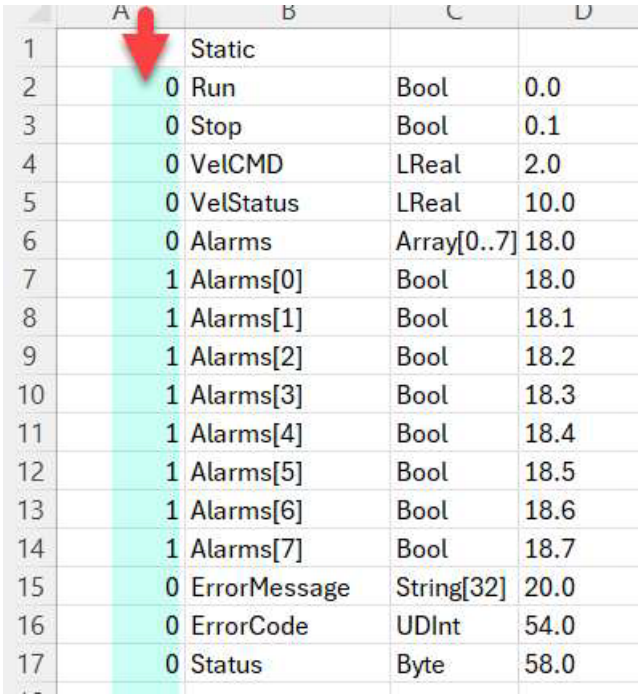
	A	B	C	D	E	F	G	H	I	J
1		Static								
2		Run	Bool	0.0	FALSE	FALSE	TRUE	TRUE	TRUE	FALSE
3		Stop	Bool	0.1	FALSE	FALSE	TRUE	TRUE	TRUE	FALSE
4		VelCMD	LReal	2.0	0.0	FALSE	TRUE	TRUE	TRUE	FALSE
5		VelStatus	LReal	10.0	0.0	FALSE	TRUE	TRUE	TRUE	FALSE
6		Alarms	Array[0..7]	18.0		FALSE	TRUE	TRUE	TRUE	FALSE
7		Alarms[0]	Bool	18.0	FALSE	FALSE	TRUE	TRUE	TRUE	FALSE
8		Alarms[1]	Bool	18.1	FALSE	FALSE	TRUE	TRUE	TRUE	FALSE
9		Alarms[2]	Bool	18.2	FALSE	FALSE	TRUE	TRUE	TRUE	FALSE
10		Alarms[3]	Bool	18.3	FALSE	FALSE	TRUE	TRUE	TRUE	FALSE
11		Alarms[4]	Bool	18.4	FALSE	FALSE	TRUE	TRUE	TRUE	FALSE
12		Alarms[5]	Bool	18.5	FALSE	FALSE	TRUE	TRUE	TRUE	FALSE
13		Alarms[6]	Bool	18.6	FALSE	FALSE	TRUE	TRUE	TRUE	FALSE
14		Alarms[7]	Bool	18.7	FALSE	FALSE	TRUE	TRUE	TRUE	FALSE
15		ErrorMess	String[32]	20.0	''	FALSE	TRUE	TRUE	TRUE	FALSE
16		ErrorCode	UDInt	54.0	0	FALSE	TRUE	TRUE	TRUE	FALSE
17		Status	Byte	58.0	16#0	FALSE	TRUE	TRUE	TRUE	FALSE

* In the figure above, the columns highlighted in light blue are those mainly used by the S7 Protocol Component.

(4) Define the registers to read and their data structure.

You need to define the registers to read and their data structure for use in the S7 Protocol Component.

Setting level numbers in the first column allows you to select the registers to read and their data structure.



	A	B	C	D
1		Static		
2	0	Run	Bool	0.0
3	0	Stop	Bool	0.1
4	0	VelCMD	LReal	2.0
5	0	VelStatus	LReal	10.0
6	0	Alarms	Array[0..7]	18.0
7	1	Alarms[0]	Bool	18.0
8	1	Alarms[1]	Bool	18.1
9	1	Alarms[2]	Bool	18.2
10	1	Alarms[3]	Bool	18.3
11	1	Alarms[4]	Bool	18.4
12	1	Alarms[5]	Bool	18.5
13	1	Alarms[6]	Bool	18.6
14	1	Alarms[7]	Bool	18.7
15	0	ErrorMessage	String[32]	20.0
16	0	ErrorCode	UDInt	54.0
17	0	Status	Byte	58.0

The meanings of the level numbers are described below.

Level	Meaning
Blank	
0	Root level Data is directly read without any header.
1	Data is read with a header, where the previous parent's level is 0.
to	
n	Data is read with a header, where the previous parent's level is n-1.

The registers to be read in the above example sheet are as follows.

Level	Data Name	Data Type	Address	Column name in the S7 Protocol Component
0	Run	Bool	0	DB_Inverter_Run
0	Stop	Bool	0.1	DB_Inverter_Stop
0	VelCMD	LReal	2	DB_Inverter_VelCMD
0	VelStatus	LReal	10	DB_Inverter_VelStatus
0	Alarms	Array[0..7]of Bool	18	Ignored
1	Alarms[0]	Bool	18	DB_Inverter_Alarms.Alarms[0]
1	Alarms[1]	Bool	18.1	DB_Inverter_Alarms.Alarms[1]
1	Alarms[2]	Bool	18.2	DB_Inverter_Alarms.Alarms[2]
1	Alarms[3]	Bool	18.3	DB_Inverter_Alarms.Alarms[3]
1	Alarms[4]	Bool	18.4	DB_Inverter_Alarms.Alarms[4]
1	Alarms[5]	Bool	18.5	DB_Inverter_Alarms.Alarms[5]
1	Alarms[6]	Bool	18.6	DB_Inverter_Alarms.Alarms[6]
1	Alarms[7]	Bool	18.7	DB_Inverter_Alarms.Alarms[7]
0	ErrorMessage	String[32]	20	DB_Inverter_ErrorMessage
0	ErrorCode	UDInt	54	DB_Inverter_ErrorCode
0	Status	Byte	58	DB_Inverter_Status

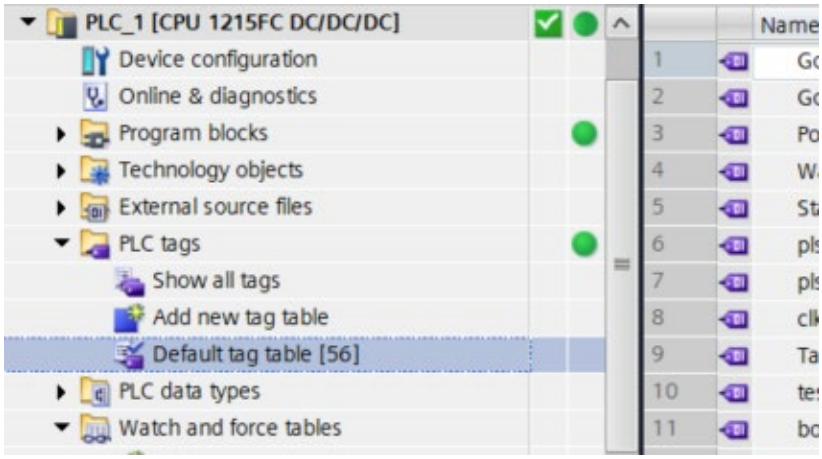
* Registers whose level is blank will not be added to the S7 Protocol Component register settings as they will not be read (i.e., ignored).
* You can modify data names directly in the CSV file.

(5) When finished editing the DB data, set the separator to semicolon (;) and save it as a CSV file.

1.5.2.Creating a CSV File for Auto Address Setting (Tag)

The workflow for creating a CSV file for a tag is similar to the procedure for creating a CSV file for a DB.

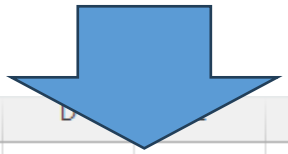
(1) Open the tag you want to write to a CSV file.



(2) Select the entire tag, and copy and paste it into Excel.

Default tag table

	Name	Data type	Address	Retain	Acces...	Writa...	Visibl...	Comm
1	GoLeft	Bool	%I0.1		☑	☑	☑	
2	GoRight	Bool	%I0.0		☑	☑	☑	
3	Position	Int	%MW50		☑	☑	☑	
4	Wave	Real	%MD100		☑	☑	☑	
5	Status	Bool	%M20.0		☑	☑	☑	
6	pls0	Bool	%M0.0		☑	☑	☑	
7	pls1	Bool	%M0.1		☑	☑	☑	
8	clk	Bool	%M10.0		☑	☑	☑	
9	Tag_1	Real	%MD20		☑	☑	☑	
10	test_wchar	WChar	%MW24		☑	☑	☑	
11	bool	Bool	%M26.1		☑	☑	☑	
12	byte	Byte	%MB26		☑	☑	☑	
13	char	Char	%MB27		☑	☑	☑	
14	wchar	WChar	%MW28		☑	☑	☑	
15	sint	SInt	%MB30		☑	☑	☑	
16	usint	USInt	%MB31		☑	☑	☑	
17	word	Word	%MW32		☑	☑	☑	



	A	B	C	D	E	F	G	H	I
1		table							
2		GoLeft	Bool	%I0.1	FALSE	TRUE	TRUE	TRUE	
3		GoRight	Bool	%I0.0	FALSE	TRUE	TRUE	TRUE	
4		Position	Int	%MW50	FALSE	TRUE	TRUE	TRUE	
5		Wave	Real	%MD100	FALSE	TRUE	TRUE	TRUE	
6		Status	Bool	%M20.0	FALSE	TRUE	TRUE	TRUE	
7		pls0	Bool	%M0.0	FALSE	TRUE	TRUE	TRUE	
8		pls1	Bool	%M0.1	FALSE	TRUE	TRUE	TRUE	
9		clk	Bool	%M10.0	FALSE	TRUE	TRUE	TRUE	
10		Tag_1	Real	%MD20	FALSE	TRUE	TRUE	TRUE	
11		test_wcha	WChar	%MW24	FALSE	TRUE	TRUE	TRUE	
12		bool	Bool	%M26.1	FALSE	TRUE	TRUE	TRUE	
13		byte	Byte	%MB26	FALSE	TRUE	TRUE	TRUE	
14		char	Char	%MB27	FALSE	TRUE	TRUE	TRUE	
15		wchar	WChar	%MW28	FALSE	TRUE	TRUE	TRUE	
16		sint	SInt	%MB30	FALSE	TRUE	TRUE	TRUE	
17		usint	USInt	%MB31	FALSE	TRUE	TRUE	TRUE	
18		word	Word	%MW32	FALSE	TRUE	TRUE	TRUE	

(3) Follow *(4) Define the registers to read and the data structure.* and later steps of the procedure for creating a CSV file for a DB, and save the tag data as a CSV file.

1.6.Precautions

The following precautions apply to this component.

- **Truncation of Strings during WString Data Collection**

  WString data collection involves internal conversion from UTF-16 to UTF-8.

  Note that, due to specifications of Speedbee Synapse, the maximum data size that can be collected is 511 bytes and any data exceeding this limit after conversion will be truncated.

2.How to Use This Component

This section describes how to use this component. Before using this component, register the following component package in Synapse.

* Refer to *6.2.6.4 Registering SCCPKG File in and Deleting SCCPKG File from Synapse* in the *DX-series SpeeDBee Synapse User's Manual (Cat. No. V243)*.

- S7 Protocol Component (This component)

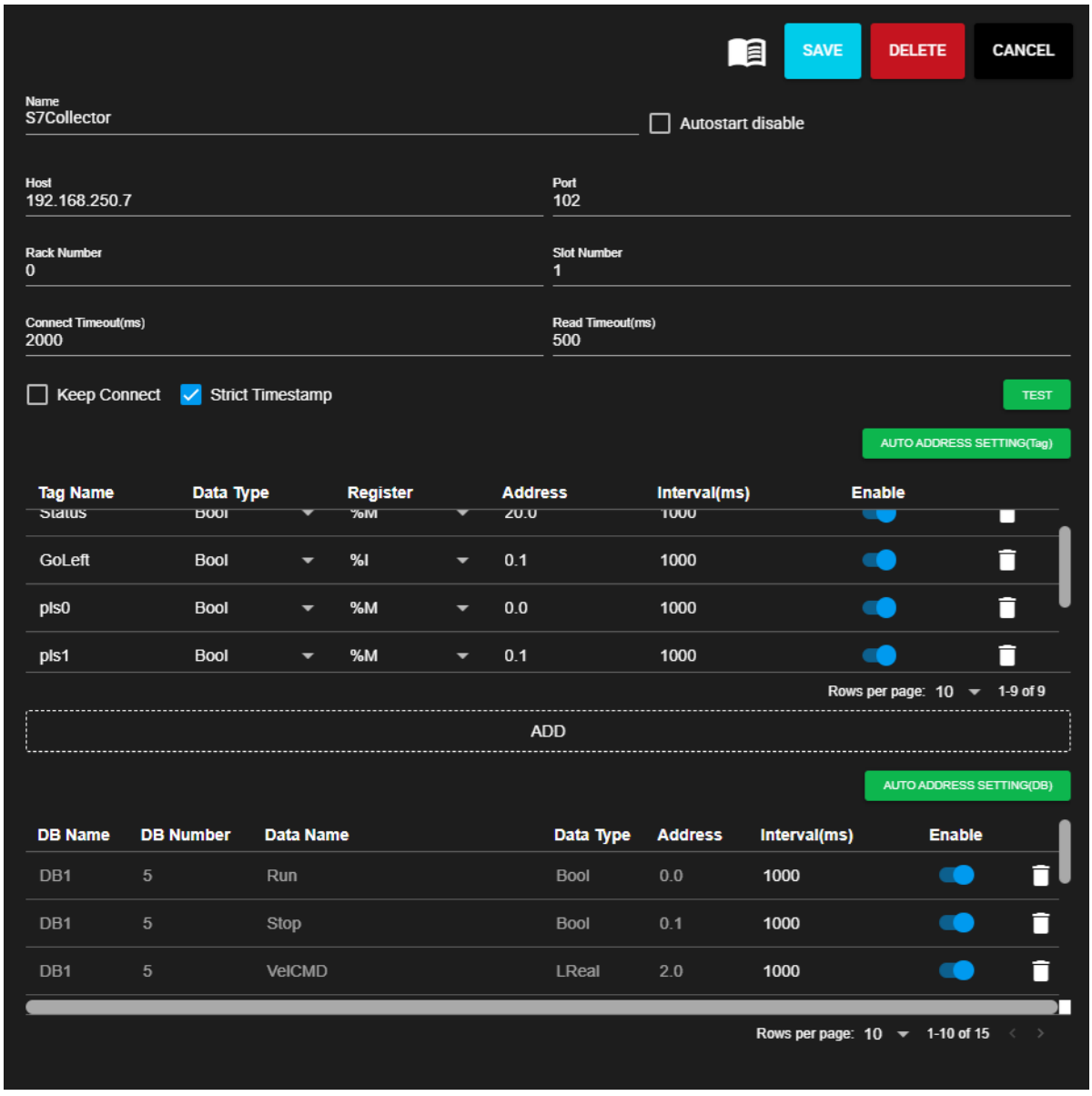
2.1.Data Flow Creation

As an example, create a data flow that uses the S7 Protocol Component for input, the CSV Serializer for formatting, and the File Emitter for locally saving files.

2.1.1.S7 Protocol Component

The figure below shows an example of parameter settings for the S7 Protocol Component.

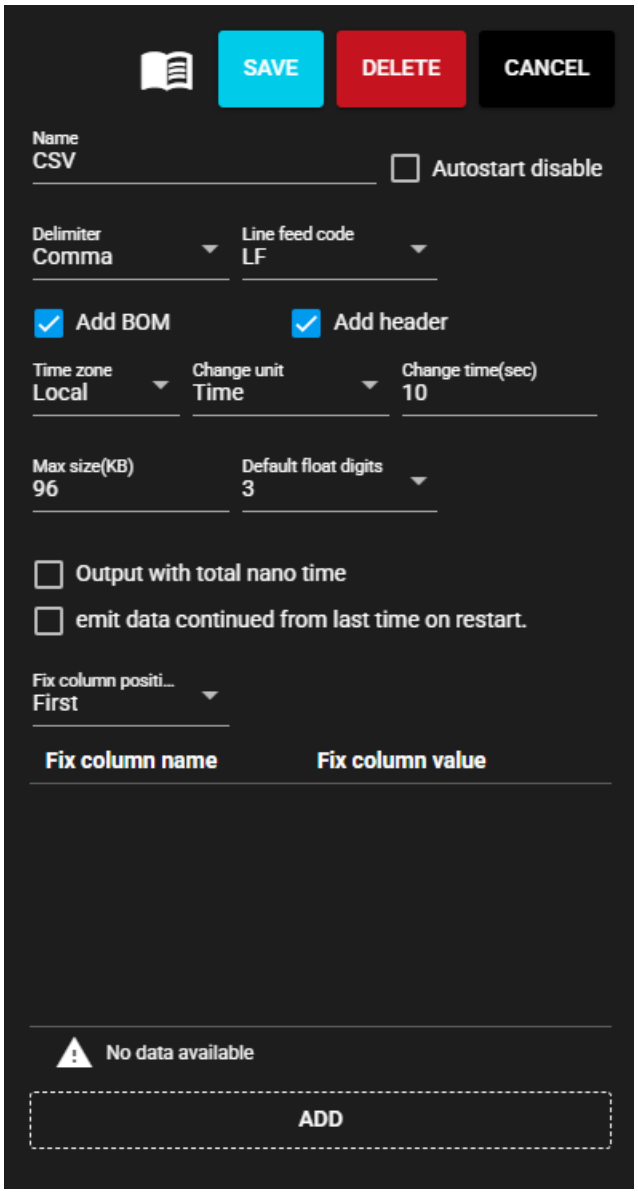
- Enter the items required for connecting to the PLC, such as the host and port settings, according to the configuration of your PLC.
- There are two ways to set the collection target data: using a tag or using a data block (DB).
- If using a tag to set the collection target data, you can either use the auto address setting (tag) function to set all addresses from a CSV file at once, or manually add settings according to the configuration of your PLC.
- If using a data block (DB) to set the collection target data, you cannot perform manual setting. Therefore, use the auto address setting (DB) function to set all addresses from a CSV file at once.



2.1.2.CSV Serializer

The figure below shows an example of parameter settings for the CSV Serializer.

Change the value for each item as needed.

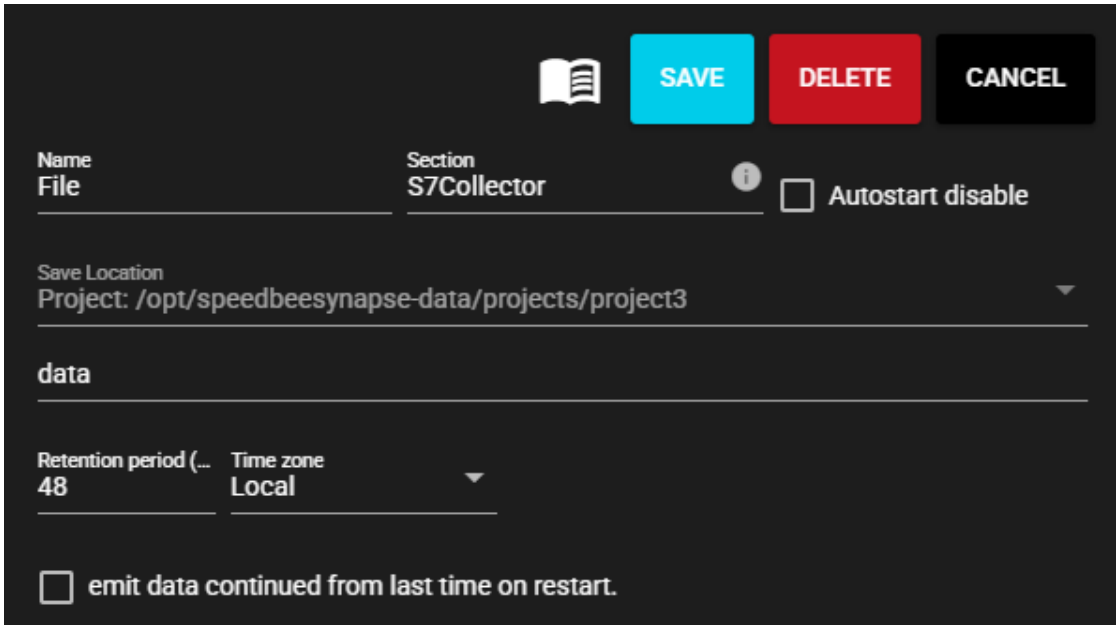


2.1.3.File Emitter

The figure below shows an example of parameter settings for the File Emitter.

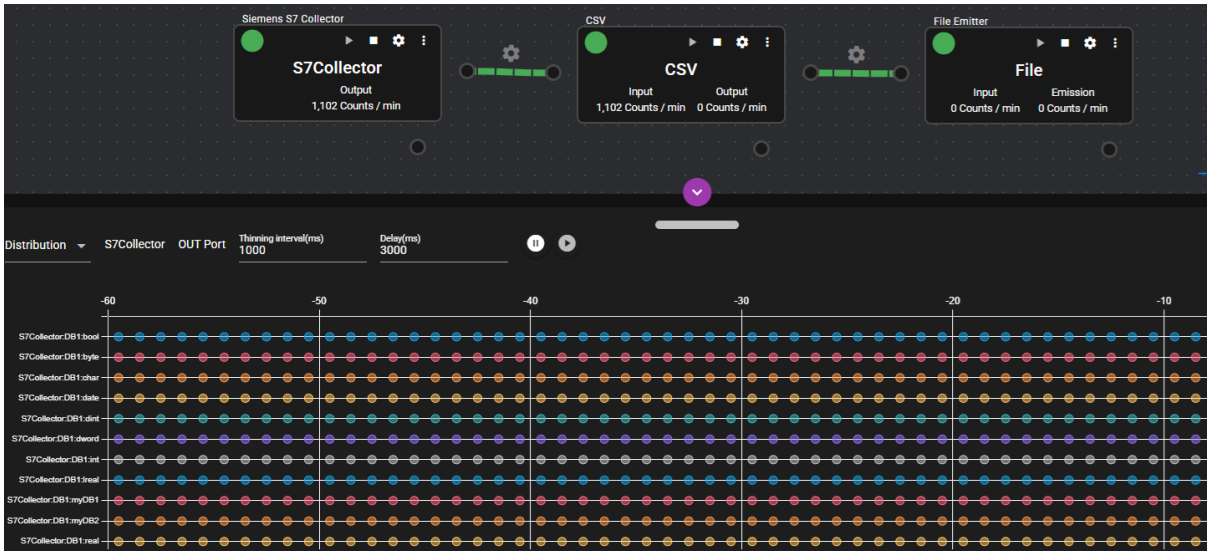
Files will be saved in the directory according to the Save Location and Section settings.

Change the value for each item as needed.



2.2.Component Execution

Start all components and check the output ports of the S7 Protocol Component using the Data Monitor to confirm that data is being collected.



CSV files are saved to a local folder via the File Emitter.

You can view the CSV data by opening the saved CSV files using an editor or similar application.

```
1  timestamp,S7Collector:DB1:bool,S7Collector:DB1:byte,S7Collector:DB1:char,S7Collector:
2  2026-03-03T15:47:13.060000000+0900,true,1,"A",11111,-12345,4294967295,-123,123.450,tr
3  2026-03-03T15:47:14.060000000+0900,true,1,"A",11111,-12345,4294967295,-123,123.450,tr
4  2026-03-03T15:47:15.060000000+0900,true,1,"A",11111,-12345,4294967295,-123,123.450,tr
5  2026-03-03T15:47:16.060000000+0900,true,1,"A",11111,-12345,4294967295,-123,123.450,tr
6  2026-03-03T15:47:17.060000000+0900,true,1,"A",11111,-12345,4294967295,-123,123.450,tr
7  2026-03-03T15:47:18.060000000+0900,true,1,"A",11111,-12345,4294967295,-123,123.450,tr
8  2026-03-03T15:47:19.060000000+0900,true,1,"A",11111,-12345,4294967295,-123,123.450,tr
9  2026-03-03T15:47:20.060000000+0900,true,1,"A",11111,-12345,4294967295,-123,123.450,tr
10 2026-03-03T15:47:21.060000000+0900,true,1,"A",11111,-12345,4294967295,-123,123.450,tr
11 2026-03-03T15:47:22.060000000+0900,true,1,"A",11111,-12345,4294967295,-123,123.450,tr
```

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